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The Future of Technical Libraries

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Abstract.
Technical libraries are currently experiencing very rapid change. In the near future their mission will change, their physical nature will change, and the skills of their employees will change. While some will not be able to make these changes, and will fail, others will lead us into a new era.

1. Introduction

We are at the end of the paper era. For the past two centuries libraries have been primarily devoted to building and maintaining vast collections of paper, documenting the myriad intellectual activities of mankind. These activities are nearing the end of their useful lives.

Many existing libraries will not be able to meet the challenges, and they will close. Others will provide the intellectual leadership necessary to support the new information seeking and storing paradigm, and will thrive.

2. The Problem

Technical libraries, unlike more general purpose libraries, are not supposed to be fun. Typical users are professionals who are engaged in a work function. In astronomy the major use has been to read journal articles, with catalogs, atlases, conference proceedings, and monographs secondary uses.

Today nearly all these sources are original electronic; and nearly all of the historical journal material, and much of the older rest has already been transformed into electronic form. The convenience of finding and using these materials at one's desk is so great that the physical use of the physical technical library has virtually collapsed. Many small departmental libraries have already closed.

While many libraries maintain responsibility for what to buy, this is also rapidly ending. Economic trends in the publishing industry are driving libraries to band together to form large buying consortia to negotiate with large publishers (or consortia of small publishers) for comprehensive packages of journals and other publications. This effectively removes the responsibility for collection development from individual libraries. The adoption of open access would also have this effect.

Finally new search technologies, such as provided by SIMBAD, NED, ADS, DataScope, Google, Amazon, and others now provide a very sophisticated reference desk function at the desktop.

It is clear that major changes will be required for libraries to meet these challenges.

3. The Future

The future is now!

Astronomy is a leader in developing the new technical libraries. Astronomers have built several new, large libraries in the last 20 years, essentially defining the new paradigm.

Obviously ADS, CDS, and NED are all basically libraries, but HEASARC, MAST, the ESO archive, the Chandra archive, etc are also, fundamentally, digital libraries. The same technological changes which are making paper obsolete are also now blurring the distinction between a library and an archive. Library based information systems, such as D-Space and Fedora make this trend even more clear.

The new library structure in astronomy is based on the existence of deep interlinking between the various groups. This is enabled by rich sets of meta-data.

An example of this interlinking is the connection between ADS and the MAST based on a research article indexed in ADS having used data from the HST and stored in the MAST. The descriptive meta-data which allows this link was first developed by Sarah Stevens-Rayburn. Many archives now create meta-data of this sort; ADS provides thousands of these links.

In the future the creation and curation of meta-data will be of even greater importance. Already international efforts, via the virtual observatory efforts in many countries, and the International Virtual Observatory Alliance, are creating new, complex meta-data standards for astronomical data of various types. There will need to be organizations to implement and maintain the large meta-data sets which will come out of the VO work. Libraries are those organizations.

4. Conclusions

The word library comes from a word for a kind of early paper. As we move inexorably away from paper as the medium for the transmission of ideas the nature of libraries *per force* will change. New talents will be required to manage the new situations. Librarians will no longer need to bind paper volumes, but they will need to write parsers.

The library of the future will be even more important to the practice of research than is true currently. Far from being quaint backwaters of aging paper our libraries will be those organizations which index, organize, and make sense of our massive, highly heterogeneous digital data flows.